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USAF Hearing Conservation Program, DOEHRS Data Repository Annual Report: CY2013

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14. ABSTRACT

The United States Air Force School of Aerospace Medicine (USAFSAM), Epidemiology Consult Service (PHR), Hearing Conservation Program (HCP) prepares an annual status report on the USAF HCP in accordance with Air Force Occupational Safety and Health Standard 48-20, Occupational Noise and Hearing Conservation Program, 2.3.7 and Department of Defense Instruction 6055.12, Hearing Conservation Program. This report covers calendar year 2013. The purpose of this report is to provide a corporate view of the status of the USAF HCP with data reported from the Defense Occupational and Environmental Health Readiness System Data Repository (DOEHRS-DR). Major command and installation level reports are available quarterly and by request from USAFSAM/PHR, as well as by those who have user-defined roles in the data repository. This report covers information regarding software implementation status; HCP effectiveness metrics, to include an overview of a few standard reports currently available in the DOEHRS-DR database; and our recommendations.

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Hearing conservation, permanent threshold shift, threshold shift trends, Defense Occupational and Environmental Health Awareness Readiness System Data Repository (DOEHRS-DR)

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1.0 INTRODUCTION

The United States Air Force School of Aerospace Medicine (USAFSAM), Epidemiology Consult Service (PHR), Hearing Conservation Program (HCP) prepares an annual status report on the USAF HCP in accordance with Air Force Occupational Safety and Health (AFOSH) Standard 48-20, Occupational Noise and Hearing Conservation Program, section 2.3.7 and Department of Defense Instruction (DoDI) 6055.12, Hearing Conservation Program [1,2]. This report covers calendar year (CY) 2013.

The purpose of this report is to provide a corporate view of the status of the USAF HCP with data reported from the Defense Occupational and Environmental Health Readiness System Data Repository (DOEHRS-DR). Major command (MAJCOM) and installation level reports are available quarterly and by request from USAFSAM/PHR, as well as by those who have user-defined roles in the data repository. This report covers information regarding software implementation status; HCP effectiveness metrics, to include an overview of a few standard reports currently available in the DOEHRS-DR database; and our recommendations.

2.0 DISCUSSION

2.1 Software Implementation Status

During 2013, the DOEHRS Project Office and the subject matter experts from each service participated in a System Qualification Testing event facilitated by development, test, and evaluation for the DOEHRS-HC [hearing conservation] version 4.1.0.3, 25 June 2013. The purpose of this release was to correct previous defects and maintain software compatibility with Occupational Safety and Health Administration (OSHA), DoD, and AF regulations. The new features to the DOEHRS-HC application relate to new roles enabled to provide limited access for Veterans Affairs users and should not have affected AF users.

Version 4.1.0.4 was released on 24 September 2013. A new feature to the DOEHRS-HC application is the Type 4 reference test, which allows for an accurate delineation of hearing tests obtained during military and civilian time in service. The Type 4 reference test is utilized to re-establish a reference test due to a change in service component/employment. Please note: A change in service component indicates a status change from military to civilian or vice versa.

2.2 HCP Effectiveness Metrics

2.2.1 Program Compliance. One measure of the effectiveness of any HCP is program compliance. Compliance is defined as the number of people in a particular program who should receive annual audiograms (denominator) compared to those people who received their audiograms (numerator). This is one of the metrics specified in DoDI 6055.12. While it is a useful metric, it does have limitations that can influence its accuracy and reflects a snapshot of the data based on the collection date. Aggregate denominator data are obtained for military and civilian personnel who were designated as requiring an audiogram in the occupational health module of DOEHRS-HC, as well as the number of flyers from Aerospace Services Information Management System Web. USAFSAM/PHR enters numerator data for each unit obtained from the DOEHRS-DR into the annual report, which is saved in the USAFSAM/PHR database. Table 1 displays the compliance data for the USAF for CY2011-2013. These rates are only

approximates but are representative of the most current denominator data available in the USAF HCP.

Table 1. Compliance Trends, CY2011-2013

CY	People Tested	Noise Exposed	Compliance (%)
CY2013			
Military	164,164	170,369	96.36
Civilian	24,468	27,704	88.32
Total	189,663	198,073	95.75
CY2012			
Military	155,509	183,249	84.86
Civilian	25,521	28,749	88.77
Total	181,916	211,998	85.81
CY2011			
Military	158,703	160,242	99.04
Civilian	26,643	26,980	98.75
Total	186,348	187,222	99.53

2.2.2 Threshold Shift Trends. The key metric for any HCP is the standard threshold shift (STS) as specified in DoDI 6055.12, and the current data follow this STS criterion. Permanent threshold shift (PTS) is defined as any STS that persists after the follow-up audiograms are completed and is a measure of permanent changes in hearing. Temporary threshold shift (TTS) is any STS that resolves after the follow-up audiograms are completed. TTS is a temporary loss of hearing due most likely to hazardous noise exposure and can be used to target intervention efforts for engineering controls and effective use of hearing protective devices. While PTS can be due to hazardous noise exposure, other factors, such as disease or aging, can cause permanent hearing changes.

Care is necessary when reviewing STS rates, as they can be affected by numerous factors, to include administrative errors and otologic pathology, causing them to change daily. Therefore, inquiries into the DR for threshold shift information are best viewed as a “snapshot” of the data in the repository for a given day. For DOEHRS purposes, TTS and PTS rates are directly influenced by the completion deadline for civilians and military. Therefore, PTS rates are influenced by follow-up audiograms obtained outside the assigned window. Table 2 represents the STS/PTS trend data for CY2011 to CY2013. The PTS rates show a slight decrease from 2011-2013. These data can be further broken down into military and civilian trend rates to determine if there are significant differences between these groups.

Table 2. STS Trends, CY2011-2013

CY	Population	STS (%)	TTS (%)	PTS (%)
CY2013				
Military	143,255	9,415 (6.57)	3,754 (2.62)	5,661 (3.95)
Civilian	23,603	3,464 (14.68)	1,083 (4.59)	2,381 (10.09)
CY2012				
Military	138,625	10,396 (7.50)	4,144 (2.99)	6,251 (4.51)
Civilian	25,195	2,519 (10.00)	1,148 (4.56)	2,630 (10.44)
CY2011				
Military	142,885	10,744 (7.52)	3,929 (2.75)	6,815 (4.77)
Civilian	25,097	3,767 (15.01)	1,116 (4.45)	2,647 (10.55)

A review of the data suggests civilian rates continue to be somewhat higher than military rates. The difference is most pronounced for the PTS rates. Overall, PTS rates for both military and civilian personnel have decreased slightly over the past 3 years. As noted above, factors other than hazardous noise exposure can influence PTS rates, the most prevalent of which is length of time working in hazardous noise environments. In some instances, military members retire and may return to the base as civilian employees in the same job duty. The effects of working in hazardous noise environments for many years will negatively affect the auditory status of many workers, as exposure over time accumulates. Some individuals are affected by a predisposition for age-related hearing loss and/or noise-induced hearing loss. Installation and MAJCOM HCP managers are encouraged to pay particular attention to efforts directed toward civilian worker areas. Table 3 lists overall PTS rates for MAJCOMs.

Table 3. STS Rates for MAJCOMs, CY2011-2013

MAJCOM	2013 (%)	2012 (%)	2011 (%)
ACC	5.42	6.84	3.68
AETC	8.12	9.21	6.89
AFDW	9.60	8.87	5.62
AFGSC	6.48	7.41	4.09
AFMC	9.02	9.33	5.72
AFR	12.13	13.49	10.31
AFSOC	5.98	6.33	3.04
AFSPC	7.47	11.37	9.57
AMC	6.40	7.40	4.89
ANG	10.80	11.43	9.00
PACAF	6.51	7.83	3.81
USAFA	5.80	8.42	7.90
USAFE	4.17	5.75	2.99

Table 4 displays hearing profile levels for H-1, H-2, and H-3 levels for military members. Hearing profiles are categories that list the minimum hearing threshold values required to qualify for a particular job or career field. These criteria are also used to identify workers who need further evaluation to determine if they are capable of performing their job safely in a hazardous noise environment. Descriptive information of each hearing profile can be found in the Medical Standards Directory.[1] These data change little from year to year. Note that the numbers for cadets differ significantly from officers and enlisted.

[1] U.S. Air Force. Medical standards directory; 2013. Retrieved 27 March 2014 from https://kx2.afms.mil/_layouts/login/Privacy.htm?ReturnUrl=%2fkj%2fkx4%2fFlightMedicine%2f_layouts%2fAuthenticate.aspx%3fSource%3d%252Fkj%252Fkx4%252FFlightMedicine%252FDocuments%252FMedical%2520Standards%2520Directory%2520%2528MSD%2529%252FMSD%25202013%252DDec%252D2%252Epdf&Source=%2Fkj%2Fkx4%2FFlightMedicine%2FDocuments%2FMedical%20Standards%20Directory%20%28MSD%29%2FMSD%202013%2DDec%2D2%2Epdf. Available to those with access.

Table 4. USAF Hearing Profiles, CY2011-2013

CY	Personnel	H-1 (%)	H-2 (%)	>= H-3 (%)
CY 2013				
Enlisted	120,224	112,170 (93.30)	5,316 (4.42)	2,738 (2.28)
Officer	31,808	29,673 (93.29)	1,508 (4.74)	627 (1.97)
CY 2012				
Enlisted	115,512	107,418 (92.99)	5,363 (4.64)	2,731 (2.36)
Officer	30,810	28,668 (93.05)	1,474 (4.78)	668 (2.17)
CY 2011				
Enlisted	120,737	111,826 (92.60)	5,930 (4.90)	2,981 (2.40)
Officer	32,497	30,041 (92.40)	1,691 (5.20)	765 (2.30)

2.3 Other HCP Updates

2.3.1 AFOSH Standard 48-20. An updated version of AFOSH Standard 48-20, Occupational Noise and Hearing Conservation Program, was released on 10 May 2013 [1]. Major changes included the following:

- Public Health will report OSHA reportable STS within seven calendar days utilizing Air Force Safety Automated System once an audiologist or overseeing provider confirms the PTS
- Organizational roles and responsibilities were clarified
- Occupational and Environmental Health Working Group (OEHWG) chair and members will consider everyone who works at the base (including aircrew) exposed to noise as identified in this standard to be included for HCP monitoring
- Public Health will export daily to the DOEHRS-DR and report HCP metrics to OEHWG monthly

2.3.2 Baseline Error Findings. New business rules implemented in March 2009 for DOEHRS-HC/DR incorporated major changes to the software that affected the priority of DD Form 2215 Reference Audiograms (baseline tests) used during the annual test. The DOEHRS-HC/DR system will give priority to "reason 3 – *Re-established after Follow-Up Program*" baselines over any other baseline type. In cases where no previous reason 3 exists, the system will use the earliest dated DD Form 2215 baseline audiogram (reason 1 – *Prior to Initial Duty* or 2 – *Following Exposure to Noise*) or manually entered baseline audiogram to determine the presence of an STS on an annual audiogram. Some annual audiograms that are "passing" (no STS) when compared with the most current available baseline in the local DOHERS-HC system may be labeled as an STS once exported to the DOEHRS-DR system.

To identify potential errors, the records of all individuals active with the DOEHRS-DR from March 2009 to February 2013 were reviewed. Out of the 338,760 individuals who received at least one hearing exam since 2009, 53,096 were found to have the most current baseline audiogram incorrectly labeled as reason 1 – *Prior to Initial Duty* or reason 2 – *Following Exposure to Noise* (approximately 15%). A further assessment was conducted on 52,849 individuals who had the baseline audiogram error occur between 2009 and 2012; 14,171 of these

individuals had a positive shift that occurred at some time after their baseline (approximately 27%). The positive shift could have been a result of the baseline error.

In July 2013, USAFSAM/PHR issued a memo to all active duty installations regarding the baseline error. The memo explained, in detail, the origin of the baseline exam errors and the steps required to correct the records of the individuals who have a baseline error. USAFSAM/PHR sent lists of individuals who currently have a baseline issue within the DOEHRS-DR to the installations where the affected individuals are currently stationed. Each installation was asked to follow the instructions provided to correct the records of these individuals to include a current baseline exam labeled with the correct reason 3 – *Re-established after Follow-Up Program.*

3.0 RECOMMENDATIONS

The DOEHRS-DR reports cited in this document reflect the data available in the data repository and the AF HCP website. Local hearing conservation program records may reflect a lower PTS rate due to the inability to resolve certain types of PTS cases within the DR and to import/export difficulties related to baselines older than 1998. The differences between the locally reported PTS rate and the PTS rate with the DR will continue to be addressed by USAFSAM/PHR through quarterly records review of common errors from each Air Force exporting location. Additionally, USAFSAM/PHR will be undertaking a more extensive analysis of the records to determine if baseline assignment significantly affects the PTS rates in the DR.

The current method of biannual PTS rate reporting from base to headquarters level involves self-reporting of each hearing conservation unit through Microsoft Excel sheets. This method is inaccurate and not recommended for several reasons: 1) the definition of a PTS is not defined for the bases to create consistency in recording, 2) there are no instructions provided to the base on the appropriate data source for this information, and 3) entries are completed by hand, which can often lead to errors. Although the PTS rates in the DR are affected by a DoD business rule change, and may be elevated compared to the actual PTS rates, the data are consistently handled in the same manner, unlike the locally generated Microsoft Excel sheets.

We strongly recommend installation and MAJCOM HCP managers review their respective programs using the metrics given in this report, as they give an initial guideline to estimate program effectiveness. Installation level reports are available for installation HCP managers to use quarterly and by request. If not already obtained, HCP managers are encouraged to apply for a DOEHRS-DR website password to gain access to these reports. MAJCOM HCP managers can also request MAJCOM access to assess trends in their respective MAJCOM. All are encouraged to contact the Hearing Conservation Program Manager at USAFSAM/PHR for assistance.

4.0 REFERENCES

1. U.S. Air Force. Occupational noise and hearing conservation program. Washington, DC: Department of the Air Force; 2013 May 10. Air Force Occupational Safety and Health Standard 48-20.
2. Department of Defense. Hearing conservation program (HCP). Washington, DC: DoD; 2010 Dec 3. DoD Instruction 6055.12.

LIST OF ABBREVIATIONS AND ACRONYMS

AFOSH	Air Force Occupational Safety and Health
CY	calendar year
DoDI	Department of Defense Instruction
DOEHRS-DR	Defense Occupational and Environmental Health Readiness System-Data Repository
DOEHRS-HC	Defense Occupational and Environmental Health Readiness System-Hearing Conservation
HCP	Hearing Conservation Program
MAJCOM	major command
OEHWG	Occupational and Environmental Health Working Group
OSHA	Occupational Safety and Health Administration
PHR	Epidemiology Consult Service
PTS	permanent threshold shift
STS	standard threshold shift
TTS	temporary threshold shift
USAFSAM	United States Air Force School of Aerospace Medicine